

In the Specification

Please amend the specification as follows:

[0026] In some embodiments, processor nodes **104, 106** are computer systems that include at least one central processing unit (CPU) and system memory wherein the CPU is configured to run operating systems **144, 146**. Processor nodes **104, 106** can additionally be configured to run one or more of any type of application program, such as primary process **116** and backup process **118**. Although system **100** is shown with two processor nodes **104, 106**, additional processor nodes (not shown) can communicate communication with SAN **112** as well as with processor nodes **104, 106** over a network (not shown) via network interfaces **108, 110, 114**.

[0032] Memory management functionality can be provided in system **100** to create one or more independent, indirectly-addressed memory regions. Moreover, NPMU meta-data can be provided for memory recovery after loss of power or processor failure. Meta-data can include, for example, the contents and layout of the protected memory regions within NPMU **102**. In this way, NPMU **102** stores the data as well as the manner of using the data. When the need arises, NPMU **102** can provide the meta-data to backup process **122** to allow system **100** to recover from a power or system failure associated with primary process **116**.

[0048] In some embodiments, backup process **122** can be configured with information regarding the location of checkpoint state **120** and/or update areas **128-132**. In other embodiments, backup process **122** can issue a message requesting the location of checkpoint state **120** and update areas **128-132** from PMM **140**, NPMU **102**, and/or primary process **116** at runtime. PMM **140**, NPMU **102**, and/or primary process **116** then issue a response message with the requested location of checkpoint state **120** and update areas **128-132** in NPMU **102**. In some embodiments, PMM **140** records information regarding the starting and ending address of the latest update to checkpoint state **120**, whether the latest information resides in checkpoint state **120** or

update areas **128-132**. The starting and ending addresses of the most current checkpoint state **120** and update areas **128-132** can then be provided upon request to backup process **122**. Permission to access memory resources in NPMU **102** can be maintained in Translation and Protection Table (TPT) **142**, which is shown in NPMU **102**. PMM **140** can create entries in TPT **142** with appropriate permissions at the time of creating or opening persistent memory regions. For instance, primary process **116** requests PMM **140** to create a region with permissions to write. Subsequently, backup process **122** opens that region with permissions to read.